**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION III**
**1650 Arch Street**
**Philadelphia, Pennsylvania 19103-2029**

Mr. Larry Lawson, Director
Division of Water Program Coordination
Virginia Department of Environmental Quality
629 Main Street
Richmond, VA 23219

Dear Mr. Lawson:

The United States Environmental Protection Agency (EPA) Region III is pleased to approve the Total Maximum Daily Loads (TMDLs) for the aquatic life (benthic) and primary contact use impairments on Smith Creek. The TMDLs were submitted to EPA for review in April 2004. The TMDLs were established and submitted in accordance with Section 303(d)(1)(c) and (2) of the Clean Water Act to address an impairment of water quality as identified in Virginia's 1998 Section 303(d) list.

In accordance with Federal regulations at 40 CFR §130.7, a TMDL must comply with the following requirements: (1) designed to attain and maintain the applicable water quality standards, (2) include a total allowable loading and as appropriate, wasteload allocations (WLAs) for point sources and load allocations for nonpoint sources, (3) consider the impacts of background pollutant contributions, (4) take critical stream conditions into account (the conditions when water quality is most likely to be violated), (5) consider seasonal variations, (6) include a margin of safety (which accounts for uncertainties in the relationship between pollutant loads and instream water quality), (7) consider reasonable assurance that the TMDL can be met, and (8) be subject to public participation. The enclosure to this letter describes how the TMDLs for the aquatic life and primary contact use impairments satisfy each of these requirements.

Following the approval of these TMDLs, Virginia shall incorporate the TMDLs into an appropriate Water Quality Management Plan pursuant to 40 CFR § 130.7(d)(2). As you know, all new or revised National Pollutant Discharge Elimination System permits must be consistent with the TMDL WLA pursuant to 40 CFR §122.44 (d)(1)(vii)(B). Please submit all such permits to EPA for review as per EPA's letter dated October 1, 1998.

If you have any questions or comments concerning this letter, please don't hesitate to contact Mr. Peter Gold at (215) 814-5236.

Sincerely,

Jon M. Capacasa, Director
Water Protection Division

Enclosure

**Decision Rationale**

**Total Maximum Daily Loads for**
**the Primary Contact (Bacteriological) and Aquatic Life Use Impairments on Smith Creek**

## I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) be developed for those water bodies identified as impaired by a state where technology-based and other controls will not provide for attainment of water quality standards. A TMDL is a determination of the amount of a pollutant from point, nonpoint, and natural background sources, including a margin of safety (MOS), that may be discharged to a water quality-limited water body.

This document will set forth the Environmental Protection Agency's (EPA's) rationale for approving the TMDLs for the primary contact (bacteriological) and aquatic life use impairments on Smith Creek. EPA's rationale is based on the determination that the TMDLs meet the following eight regulatory conditions pursuant to 40 CFR §130.

1) The TMDLs are designed to implement applicable water quality standards.
2) The TMDLs include a total allowable load as well as individual waste load allocations and load allocations.
3) The TMDLs consider the impacts of background pollutant contributions.
4) The TMDLs consider critical environmental conditions.
5) The TMDLs consider seasonal environmental variations.
6) The TMDLs include a margin of safety.
7) There is reasonable assurance that the TMDLs can be met.
8) The TMDLs have been subject to public participation.

## II. Background

The Smith Creek Watershed is located in Rockingham and Shenandoah Counties, Virginia. Smith Creek is a tributary to the North Fork of the Shenandoah River. The bacteriological impairment on Smith Creek begins at its headwaters and continues to its confluence with the North Fork of the Shenandoah River. The aquatic life (benthic) use impairment begins at the confluence of Lacey Spring Branch and Smith Creek and continues to Smith Creek's confluence with the North Fork of the Shenandoah River. Several tributaries to Smith Creek were identified as having benthic impairments as well. These streams include Mountain Run, Fridley Run and Lacey Spring Branch. A TMDL has been completed for Lacey Spring Branch, separate TMDLs will be developed for Fridley and Mountain Run. The 68,000 acre watershed is rural with forested and agricultural lands making up 50 and 47 percent of the

watershed respectively. Residential and commercial lands make-up the remainder of the

watershed.

In response to Section 303(d) of the CWA, the Virginia Department of Environmental Quality (VADEQ) listed 31.18 and 15.71 miles of Smith Creek (VAV-B47R) on Virginia's 1998 Section 303(d) list as being unable to attain the primary contact and aquatic life uses. The decision to list Smith Creek for these impairments was based on observed violations of the Commonwealth's bacteriological criteria and assessments of the biological assemblage. At the time of its listing, the bacteria criteria used fecal coliform as an indicator species and had an instantaneous standard 1,000 colony forming units (cfu) per 100 milliliters (ml) and geometric mean standard of 200 cfu/100ml. This decision rationale will address the TMDLs for both impairments.

Fecal coliform is a bacterium which can be found within the intestinal tract of all warm blooded animals. Therefore, fecal coliform can be found in the fecal wastes of all warm blooded animals. Fecal coliform in itself is not a pathogenic organism. However, fecal coliform indicates the presence of fecal wastes and the potential for the existence of other pathogenic bacteria. The higher concentrations of fecal coliform indicate the elevated likelihood of increased pathogenic organisms.

EPA encouraged the states to use e-coli and enterococci as the indicator species instead of fecal coliform. A better correlation was drawn between the concentrations of e-coli and enterococci, and the incidence of gastrointestinal illness. The Commonwealth adopted e-coli and enterococci criteria in January 2003. According to the new criteria, streams will be evaluated via the e-coli and enterococci criteria after 12 samples have been collected using these indicator species. The fecal coliform criteria will be used in the interim. Twelve e-coli samples were collected from Smith Creek, and it is therefore, assessed according to the new criteria.

As Virginia designates all of its waters for primary contact, all waters are required to meet the bacteriological standard for primary contact. Virginia's standard applied to all streams designated as primary contact for all flows. The e-coli criteria requires a geometric mean concentration of 126 cfu/100ml of water with no sample exceeding 235 cfu/100ml of water. Unlike the fecal coliform criteria, which allows for a 10 percent violation rate, the new e-coli criteria requires the concentration of e-coli not exceed 235 cfu/100ml of water.

Although the TMDL and criteria require the 235 cfu/100ml of water concentration limit not be exceeded, waters are not placed on the Section 303(d) list if their violation rate does not exceed 10 percent. Therefore, Smith Creek may be deemed as attaining its primary contact use prior to the implementation of all of the TMDL reductions. It is necessary to keep this in mind because of the reductions required to attain the instantaneous criteria for e-coli in the model.

To assess the biological integrity of a stream, Virginia uses EPA's Rapid Bioassessment

Protocol II (RBPII) to determine the status of a stream's benthic macroinvertebrate community.[1] This approach evaluates the benthic macroinvertebrate community between a monitoring site and its reference station. Measurements of the benthic community, called metrics, are used to identify differences between monitored and reference stations.[2] The state is currently in the process of changing this methodology to a stream condition index (SCI) approach.

As part of the RBPII approach, reference stations are established on streams which are minimally impacted by humans and have a healthy benthic community. These reference stations represent the desired community for the monitored sites. Monitored sites are evaluated as non-impaired, slightly impaired, moderately impaired, or severely impaired based on a comparison of the biological community of the reference and monitored sites. Streams that are classified as moderately (after a confirmatory assessment) or severely impaired after an RBPII evaluation are classified as impaired and are placed on the Section 303(d) list of impaired waters. Smith Creek and three of its tributaries were assessed as moderately impaired.

The RBPII analysis assesses the health of the macroinvertebrate community of a stream. The analysis will inform the biologist if the stream's benthic community is impaired. However, it will not inform the biologist as to what is causing the degradation of the benthic community. Additional analysis is required to determine the pollutants which are causing the impairment. TMDL development requires the identification of impairment causes and the establishment of numeric endpoints that will allow for the attainment of designated uses and water quality criteria.[3] A reference watershed approach was used to determine the endpoints for Smith Creek. Numeric endpoints represent the water quality goals that are to be achieved through the implementation of the TMDL which will allow the impaired water to attain its designated use. A reference watershed approach is based on selecting a non-impaired watershed that shares similar landuse, ecoregion, and geomorphological characteristics with the impaired watershed. The stream conditions and loadings in the reference stream are assumed to be the conditions needed for the impaired stream to attain standards.

Since the state is switching to the SCI for biological assessments, the TMDL modelers evaluated Smith Creek based on the SCI. Unlike the RBPII analysis, the SCI has a scoring system based on a statistical analysis of a large benthic database.[4] Therefore, the SCI does not evaluate the benthic community on a one to one basis but evaluates the monitored community against the condition of several nonimpaired waters at once. When using the SCI method, the

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[1]Tetra Tech 2002. Total Maximum Daily Load (TMDL) Development for Blacks Run and Cooks Creek. Fairfax, Virginia.

[2]Ibid 1

[3]Ibid 1

[4]MapTech, 2004, General Standard Total Maximum Daily Load Development for Unnamed Tributary to Deep Creek.

benthic community on Smith Creek was evaluated as slightly impaired to nonimpaired. The conditions on Fridley and Mountain Run are moderately impaired using either methodology.

The TMDL submitted by Virginia is designed to determine the acceptable load of e-coli which can be delivered to the impaired segment, as demonstrated by the Loading Simulation Program C++ (LPSC)[5], in order to ensure that the water quality standard is attained and maintained. LPSC is considered an appropriate model to analyze the impaired water because of its dynamic ability to simulate both watershed loading and receiving water quality over a wide range of conditions. The model was run to determine the e-coli loading to Smith Creek. A translator equation was used to convert fecal coliform results to e-coli.

The TMDL analysis allocates the application/deposition of fecal coliform to land based and instream sources. For land based sources, the LPSC model accounts for the buildup and washoff of pollutants from these areas. Buildup (accumulation) refers to all of the complex spectrum of dry-weather processes that deposit or remove (die-off) pollutants between storms.[6] Washoff is the removal of fecal coliform which occurs as a result of runoff associated with storm events. These two processes allow the model to determine the amount of fecal coliform from land based sources which is reaching the stream. Point sources and wastes deposited directly to the stream were treated as direct deposits. Wastes which are deposited directly to the stream do not need a transport mechanism.

Local rainfall and temperature data were needed to develop the model. Weather data provides the rainfall data which drives the TMDL model. Weather data was obtained from the weather stations at Woodstock and Edinburg.

Stream flow data was available from a United States Geological Survey (USGS) gage (01632900) on Smith Creek. The hydrologic model was calibrated and validated against observed flow data from this gage. The benthic TMDL was developed using the Generalized Watershed Loading Function model (GWLF). The GWLF model provides the ability to simulate runoff, sediment, and nutrient loadings from watersheds given variable source areas (e.g., agricultural, forested, and developed land).[7] GWLF is a continuous simulation model that uses daily time steps for weather data and water balance calculations.[8] Calculations are made for sediment based on daily water balance totals that are summed to give monthly values. To equate the reference watershed with the monitored watershed, the reference watershed was decreased in size to that of the impaired watershed in the model, the landuses were proportionally decreased

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[5]Tetra Tech, 2004. Total Maximum Daily Load (TMDL) Development for Smith Creek

[6]CH2MHILL, 2000. Fecal Coliform TMDL Development for Cedar, Hall, Byers, and Hutton Creeks Virginia.

[7]Ibid 1

[8]Ibid 1

based on the percent landuse distribution. Therefore, the landuse breakdown in the reference watershed remained constant. Table 1 summarizes the TMDL loadings for Smith Creek.

Table 1 - Summarizes the Specific Elements of the TMDLs.

| Segment | Parameter | TMDL | WLA | LA | MOS |
|---|---|---|---|---|---|
| Smith Creek | E-coli (cfu/yr) | 1.33E+13 | 8.53E+11 | 1.24E+13 | Implicit |
| Smith Creek | Sediment (lbs/yr) | 2.70E+07 | 3.53E+05 | 2.40E+07 | 2.70E+06 |

The United States Fish and Wildlife Service has been provided with copy of these TMDLs.

## III. Discussion of Regulatory Conditions

EPA finds that Virginia has provided sufficient information to meet all of the eight basic requirements for establishing a primary contact (bacteriological) and aquatic life (benthic) use impairment TMDLs for Smith Creek. EPA is therefore approving these TMDLs. EPA's approval is outlined according to the regulatory requirements listed below.

*1) The TMDLs are designed to meet the applicable water quality standards*.

Virginia has indicated that excessive levels of fecal coliform due to nonpoint sources (both wet weather and directly deposited nonpoint sources) have caused violations of the water quality criteria and designated uses on Smith Creek. The water quality criterion for fecal coliform was a geometric mean 200 cfu/100ml or an instantaneous standard of no more than 1,000 cfu/100ml. Two or more samples over a thirty-day period are required for the geometric mean standard. Since the state rarely collects more than one sample over a thirty-day period, most of the samples were measured against the instantaneous standard. Approximately 34 percent of the samples collected from monitoring stations on Smith Creek violated the applicable criteria for e-coli.

The Commonwealth has changed its bacteriological criteria as indicated above. The new criteria require the fecal coliform concentration not exceed a geometric mean of 200 cfu per 100ml of water for two or more samples collected over a month nor shall more than 10 percent of the total samples exceed 400 cfu/100ml of water. The new e-coli criteria requires a geometric mean of 126 cfu/100ml of water with no sample exceeding 235 cfu/100ml.

The LPSC model was used to determine the bacteria deposition rates to the land as well as loadings to the stream from direct deposit sources. Once the existing load was determined,

allocations were assigned to each source category to develop a loading pattern that would allow Smith Creek to support the e-coli water quality criterion and primary contact use. The following discussion is intended to describe how controls on the loading of e-coli to Smith Creek will ensure that the criterion is attained.

The TMDL modelers determined the bacteria production rates within the watershed. Data used in the model was obtained from a wide array of sources, including farm practices in the area, the amount and concentration of farm animals, animal access to the stream, wildlife in the watershed, wildlife fecal production rates, landuses, weather, stream geometry, etc.. The model combined all of the data to determine the hydrology and water quality of the stream. The lands within the watershed were categorized into specific landuses. The landuses had specific loading rates and characteristics that were defined by the modelers. Therefore, the loading rates are different in lands defined as forested versus pasture. Pasture lands support cattle and are influenced differently by stormwater runoff.

The Smith Creek TMDL model was run using weather data collected from the Edinburg and Woodstock weather stations. This data was used to determine the precipitation rates in the watershed which transport land deposited pollutants to the stream through overland and groundwater flows. Waste that was deposited to the land or stored was subjected to a die-off rate. Materials that were washed off the surface shortly after deposition were subjected to less die-off. The hydrology model of the TMDL was calibrated and validated to USGS gage data from Smith Creek. The water quality model for bacteria was calibrated to observed data collected from the stream as well.

As stated above, the biological assessments on Smith Creek were not able to discern a clear stressor to the Creek. The TMDL modelers therefore conducted a stressor identification analysis to determine what was impacting the benthic community. Ambient water quality data was able to rule out dissolved oxygen (DO), temperature, pH or toxics as the stressors to Smith Creek. Since excessive nutrient loadings to the stream were expected to manifest themselves in low DO levels, this stressor was ruled out based on an analysis of the DO data. Although, elevated levels of nutrients were observed. Sediment was seen as the stressor to Smith Creek. Excessive sediment loadings can destroy critical habitat areas, clog an organisms gills and respiratory ability, and lower the instream visibility for predators. Nutrient loads to Smith Creek should be reduced by the controls placed on sediment reaching the stream.

The biological impairments on Fridley and Mountain Run were caused by acid rain lowering the pH levels of the waters. The GWLF model was used to determine the loading rates of sediment to the reference and impaired creek from all point and nonpoint sources. The TMDL modelers determined the sediment loading rates within each watershed. Data used in the model was obtained on a wide array of items, including landuses in the area, point sources in the watershed, weather, stream geometry, etc..

The GWLF model provides the ability to simulate runoff and sediment loadings from watersheds given variable source areas (e.g., agricultural, forested, and developed land). GWLF is a continuous simulation model that uses daily time steps for weather data and water balance

calculations.[9] To equate the reference watershed (Hays Creek) with the monitored watershed, the reference watershed was decreased in size to that of the impaired stream in the model. Each landuse was decreased in equal proportion, insuring that the landuse breakdown in the reference watershed remained constant. Local rainfall and temperature data were needed to simulate the hydrology, this data was obtained from the Dale Enterprise and Edinburg and Woodstock weather stations for Hays and Smith Creek respectively. In the GWLF model, the nonpoint source load calculation is affected by terrain conditions, such as the amount of agricultural land, land slope, soil erodibility, and farming practices used in the area.[10] Parameters within the model account for these conditions and practices. Since there were flow gages within the impaired and reference watersheds, the hydrology component of the model was calibrated to observed flow data. The sediment TMDL applied the sediment loadings of the area adjusted reference watershed to Smith Creek. The bacteria TMDL was developed to insure that the model did not record a violation in either the instantaneous or geometric mean criteria.

*2) The TMDLs include a total allowable load as well as individual waste load allocations and load allocations.*

Total Allowable Loads

Virginia indicates that the total allowable loading is the sum of the loads allocated to land based precipitation driven nonpoint source areas (forest and agricultural land segments) and point sources. Activities that increase the levels of bacteria and sediment to the land surface or their availability to runoff are considered flux sources. The actual value for total loading can be found in Table 1 of this document. The total allowable load is calculated on an annual basis.

Waste Load Allocations

Thirty-eight regulated facilities were identified as discharging to the Smith Creek Watershed. There are 25 general, four stormwater and nine individually permitted facilities discharging to Smith Creek. All of the facilities were permitted for sediment and 33 were permitted for the discharge of bacteria. In order to determine the WLA for the non-stormwater facilities the permitted pollutant concentration of 30 mg/L of sediment and 126 cfu/100ml for e-coli should be multiplied by the permitted flow and 365 days after making the appropriate conversions. For the stormwater facilities the average annual flow determined via the model was multiplied by the allowable pollutant concentrations of 100 mg/L for sediment and 126 cfu/100ml for e-coli. Table 2 lists the WLAs for the facilities within the watershed.

EPA regulations require that an approvable TMDL include individual waste load allocations (WLAs) for each point source. According to 40 CFR 122.44(d)(1)(vii)(B), “Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion,

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[9]Ibid 1

[10]Ibid 1

or both, are consistent with assumptions and requirements of any available WLA for the discharge prepared by the state and approved by EPA pursuant to 40 CFR 130.7." Furthermore, EPA has authority to object to the issuance of any National Pollutant Discharge Elimination System (NPDES) permit that is inconsistent with the WLAs established for that point source.

Table 2 - WLAs for Smith Creek

| Facility | Permit Number | E-Coli (cfu/yr) | Sediment (lbs/yr) |
|---|---|---|---|
| Valley View Mobile Home Court | VA0027626 | 3.48E+10 | 2,735 |
| New Market Poultry Products | VA0054453 | 5.22E+11 | 134,382 |
| Two Hills Inc. STP | VA0080535 | 9.40E+09 | 740 |
| Endless Caverns Inc. | VA0071846 | 8.01E+09 | 1,641 |
| Lacey Spring Elementary School | VA0077399 | 1.31E+10 | 1,030 |
| Holtzman Express-Mauzy | VA0090794 | 1.04E+10 | 820 |
| Harrisonburg-New Market KOA | VA0088994 | 1.74E+10 | 1,368 |
| Camp Overlook | VA0083305 | 5.22E+10 | 4,112 |
| Shenandoah Fisheries | VA0091235 | N/A | 370 |
| Superior Concrete | VAG110131 | N/A | 91 |
| Rockingham Redi-Mix Plant | VAR100591 | N/A | 98,000 |
| Holtzman Express-Mauzy | VAR102386 | N/A | 69,142 |
| Harpers Lawn Ornaments | VAR051331 | N/A | 17,329 |
| City of Harrisonburg MS-4 | VAR040075 | 2.88E+12 | 19,797 |
| 24 General Permits Single Family Homes | | 1.74E+09 (each) | 91.4 (each) |

Load Allocations

According to Federal regulations at 40 CFR 130.2(g), load allocations (LAs) are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting loading. Wherever possible, natural and nonpoint source loads should be distinguished.

In order to accurately simulate landscape processes and nonpoint source loadings of

bacteria, VADEQ used the LPSC model to represent the impaired watersheds. The LPSC model is a comprehensive modeling system for the simulation of watershed hydrology, point and nonpoint source loadings, and receiving water quality. LPSC uses precipitation data for continuous and storm event simulation to determine total loading to the impaired segments from the various landuses within the watershed. For the sediment TMDL, the GWLF model was used to ascertain the sediment loading to the Creek. This model provides the monthly sediment load to the stream through the use of the universal soil loss equation (USLE). The USLE derives the sediment loading by using information on precipitation rates, best management practices (BMPs), land slope, and vegetative cover. Tables 3a and 3b list the LAs for Smith Creek. The reductions needed to insure that the instantaneous bacteria criteria is attained at all times is extremely stringent. If the 10 percent violation rate required for a water to be placed on the Section 303(d) list was used as an endpoint, the reductions would not be as stringent. Phosphorous levels in the stream should be reduced as a result of the practices used to control sediment.

Table 3a - LA for Bacteria (E-coli) for Smith Creek

| Source Category | Existing Load (cfu/yr) | Proposed Load (cfu/yr) | Percent Reduction |
|---|---|---|---|
| Livestock Direct Deposit | 1.68E+13 | 8.38E+11 | 95 |
| Wildlife Direct Deposit | 2.64E+12 | 2.64E+12 | 0 |
| Straight Pipes | <1.0E+4 | 0.0 | 100 |
| Built-Up | 1.15E+13 | 5.77E+11 | 95 |

| | | | |
|---|---|---|---|
| Cropland | 3.45E+13 | 2.76E+12 | 92 |
| Pasture | 5.93E+13 | 4.74E+12 | 92 |
| Forest | 8.65E+11 | 8.65E+11 | 0 |

Table 3b - LA for Sediment for Smith Creek

| Source Category | Existing Load (lbs/yr) | Proposed Load (lbs/yr) | Percent Reduction |
|---|---|---|---|
| Forest | 299,718 | 299,718 | 0 |
| Pasture | 24,410,967 | 19,040,555 | 22 |
| Cropland | 5,411,881 | 4,221,267 | 22 |
| Transitional | 465,460 | 363,059 | 22 |
| Urban | 99,517 | 77,623 | 22 |

*3) The TMDLs consider the impacts of background pollution.*

The TMDL considers the impact of background pollutants by considering the bacteria and sediment loadings from background sources like wildlife.

*4) The TMDLs consider critical environmental conditions.*

According to EPA's regulation 40 CFR 130.7 (c)(1), TMDLs are required to take into account critical conditions for stream flow, loading, and water quality parameters. The intent of this requirement is to ensure that the water quality of Smith Creek is protected during times when it is most vulnerable.

Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be

undertaken to meet water quality standards[11]. Critical conditions are a combination of environmental factors (e.g., flow, temperature, etc.), which have an acceptably low frequency of occurrence. In specifying critical conditions in the waterbody, an attempt is made to use a reasonable "worst-case" scenario condition. For example, stream analysis often uses a low-flow (7Q10) design condition because the ability of the waterbody to assimilate pollutants without exhibiting adverse impacts is at a minimum.

The LPSC and GWLF models were run over a multi-year period to insure that they accounted for a wide range of climatic conditions. The allocations developed in these TMDLs will, therefore, insure that the criteria are attained over a wide range of environmental conditions including wet and dry weather conditions.

*5) The TMDLs consider seasonal environmental variations.*

Seasonal variations involve changes in stream flow and loadings as a result of hydrologic and climatological patterns. In the continental United States, seasonally high flows normally occur in early spring from snow melt and spring rain, while seasonally low flows typically occur during the warmer summer and early fall drought periods.

Bacteria and sediment loadings also change during the year based on crop cycles, waste application rates, vegetative cover and cattle access patterns. Consistent with the discussion regarding critical conditions, the LPSC and GWLF models and TMDL analysis effectively considered seasonal environmental variations through the use of observed weather data over an extended period of time and by modifying waste application rates, crop cycles, and livestock practices.

*6) The TMDLs include a margin of safety.*

This requirement is intended to add a level of safety to the modeling process to account for any uncertainty. The MOS may be implicit, built into the modeling process by using conservative modeling assumptions, or explicit, taken as a percentage of the WLA, LA, or TMDL. Virginia included an implicit MOS in the bacteria TMDL through the use of conservative modeling assumptions in the determination of bacteria loadings and production. An explicit MOS for the sediment TMDL was developed by removing 10 percent of the loading and assigning it to the MOS.

*7) There is a reasonable assurance that the TMDLs can be met.*

EPA requires that there be a reasonable assurance that the TMDLs can be implemented. WLAs will be implemented through the NPDES permit process. According to

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[11]EPA memorandum regarding EPA Actions to Support High Quality TMDLs from Robert H. Wayland III, Director, Office of Wetlands, Oceans, and Watersheds to the Regional Management Division Directors, August 9, 1999.

40 CFR 122.44(d)(1)(vii)(B), the effluent limitations for an NPDES permit must be consistent with the assumptions and requirements of any available WLA for the discharge prepared by the state and approved by EPA. Furthermore, EPA has authority to object to issuance of an NPDES permit that is inconsistent with WLAs established for that point source.

Nonpoint source controls to achieve LAs can be implemented through a number of existing programs such as Section 319 of the CWA, commonly referred to as the Nonpoint Source Program. There is also overlap between the BMPs used for reducing these pollutants. Removing the cattle from the stream will reduce the bacteria and sediment loads to the stream.

*8) The TMDLs have been subject to public participation.*

Two public meetings were held to discuss and disseminate the Smith Creek TMDL to the public. The first meetings was held in the Arthur L. Hildreth Municipal Building in New Market, Virginia. The meeting was held on August 27, 2003 from 7 to 10 p.m., 20 people attended the meeting. The second meeting was held on March 15, 2004 from 7 to 10 p.m. in the Tenth Legion Ruritan Hall in Tenth Legion, VA. Thirty-three people attended the second meeting. The meetings were both noticed in the Virginia Register. Written comments were received after the second meeting and were addressed by VADEQ.